WE CLAIM:

1. In an underground containment barrier excavating and emplacement apparatus having means for excavating earthen material from about a buried waste site, and conveyor means for carrying the excavated material outwardly of the apparatus, the improvement comprising a sensor system for sensing physical properties of the excavated material including:

sensing means disposed adjacent the conveyor means for sensing selected physical properties of the material carried by the conveyor means, and for producing signals identifying the sensed physical properties, and

signal processor means for processing said signals and for producing human perceivable representations of the physical properties identified by the signals.

2. A sensor system as in claim 1 wherein said sensing means comprises a gamma ray spectrometer disposed above the conveyor means for detecting radiation emanating from the material on the conveyor means.

3. A sensor system as in claim 1 wherein said sensing means comprises an X-ray fluorescence detector disposed above the conveyor means for detecting the presence of RCRA metals in the material on the conveyor means.

4. A sensor system as in claim 1 wherein said sensing means comprises scintillating fiber bundle means disposed below/above the conveyor means for detecting radiation emanating from the material on the conveyor means.

5. A sensor system as in claim 1 wherein said sensing means comprises an acousto-optic tunable filter disposed above the conveyor means for detecting volatile organic compounds present in the material on the conveyor means.

6. A sensor system as in claim 1 wherein said sensing means comprises a Fourier-transform infrared spectrometer disposed above the conveyor means for detecting volatile organic compounds present in the material on the conveyor means.

7. Apparatus for detecting soil conditions at a buried waste containment site comprising:

means for excavating soil from about the site, said excavating means including cutting teeth for cutting into the soil, and

sensor means disposed on the cutting teeth for measuring certain conditions of the soil into which the cutting teeth cut.